

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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**L033.866**

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*Date of Application and filing Complete Specification* March 10, 1965.

*No.* 10129/65.

*Complete Specification Published* June 22, 1966.

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Index at acceptance:—E1 K2B

Int. Cl.:—E 04 c 3/08

## COMPLETE SPECIFICATION

### Improvements in or relating to Lattice Building Elements

5 We, ALLOC LIMITED, a Body Corporate organised under the Laws of Great Britain, of 53, Shakespeare Road, Mill Hill, London, N.W.7, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

10 This invention relates to building elements, its object being to provide an improved constructional element which can readily be assembled on site from materials which are conducive to easy stacking, transporting, and handling.

15 According to the present invention a constructional element comprises a lower runner including two laterally spaced channels, an upper runner including an inverted channel, and a stiff filamentary member disposed longitudinally between the upper and lower runners and passing across between the upper and lower runners, said filamentary member including portions engaged in and locked in the channels of the upper and lower runners.

25 The upper and lower runners may conveniently be constituted by portions, of indefinite length, of cold-rolled or pressed steel strip. As such portions are relatively thin and have identical cross-section, they can readily be stacked. The filamentary member may conveniently be made of a suitably heavy gauge of steel wire or rod which, whilst being bendable by machine or manually, is nevertheless stiff enough to be self-supporting and serve as a reinforcement for cladding concrete.

35 In a preferred form, the filamentary member is shaped as a symmetrical zig-zag, that is to say each crossing portion lies at the same angle of inclination with respect to the longitudinal axis of the whole. The bends of the zig-zag are engaged in the channels of the upper and lower runners.

The filamentary member may have portions engaged alternately in the two spaced channels of the lower runner, e.g. where the filamentary member is a zig-zag, alternate bends of its lower limit are disposed in the respective channels by bending out those bends to one side and the other appropriately.

50 A preferred means for locking the filamentary member in the channels of the runners comprises a tenon formed in the side wall of the channel, e.g. so that the filamentary member becomes disposed between the base of the channel and the tenon. Such tenons may be formed, after insertion of the filamentary member, by inward displacement of the material of the side wall, e.g. by a crimping machine.

60 For additional strengthening of the upper and lower runners against longitudinal bending and for better engagement with the cladding concrete, the upper and lower runners may advantageously be provided with edge portions turned over at small radius.

65 In order to form a reinforced concrete beam of inverted T-section, such a construction element may be provided with a first rectilinear cladding of concrete about the lower runner, thereby to form a simple spanning beam, and thereafter a second rectilinear cladding of concrete is provided about the connecting member and the upper runner, thereby to complete the beam.

75 In order that the nature of the invention may be readily ascertained, an embodiment of constructional element in accordance therewith is hereinafter particularly described with reference to the figures of the accompanying drawing, wherein:—

80 Fig. 1 is a perspective elevation of part of the element in assembled condition;

Fig. 2 is a vertical cross-section through a lower runner of the element;

85 Fig. 3 is a perspective view of part of a

wire member forming a connecting web for the upper and lower runners;

Fig. 4 is a section taken on the line IV—IV of Fig. 1, to show details of the method of interconnection of the wire member and the top runner;

Fig. 5 is a section taken on the line V—V of fig. 4;

Fig. 6 is a cross-section of the upper runner prior to insertion of the wire member;

Fig. 7 is a cross-section of a modified upper runner.

Figure 8 shows the element formed into a beam by cladding with concrete.

Referring to figs. 1 and 2, the lower runner is conveniently formed as a steel strip which is cold-rolled or bent up from the flat so as to have a deep channel 1 along each side and a part-cylindrical trough 2 centrally. The outer edges are each curled over downwardly at a small radius as at 3.

The upper runner is again a cold-rolled steel strip, of considerably less width, shaped to have a relatively deep central channel 4 and an upturned curled edge formation of small radius 5 at each side.

The connecting wire member is formed initially as a simple planar zig-zag shape 6.

To assemble the constructional element the upper end bends 7 are inserted into the channel 4 of the upper runner, and the zig-zag wire is pulled between its end to stretch it until the upper ends 7 are disposed at a desired separation along the longitudinal dimension of the upper runner. Thereafter, a punch or crimping tool is applied to the side wall 8 of the upper runner to form therein an inwardly displaced tenon 9 which engages in the upper end loop of the wire member and serves to lock it firmly in the channel 4, as will be readily apparent from figs. 4 and 5.

The lower end bends 10 of the wire member are then bent laterally outwards alternately one to one side and the next to the other side of the general plane of the wire member, thereby to permit those bends 10 to be engaged in the respective channels 1 at each side of the lower runner.

At the point where each lower end bend 10 is engaged in its channel, the outer side wall 11 of the respective channel is similarly provided with an inwardly bulged tenon 12 serving to lock the wire member in the respective channel.

Referring to fig. 7, there is shown in vertical cross-section a modified upper runner 13 having a similar central channel 14 but provided with edges 15 which are intumed at small radius instead of being outturned in the manner shown in figs. 1, 4, 5 and 6.

Referring now to fig. 8, the completed constructional element has its lower runner embedded in concrete 16 to form a beam. Where a number of such beams are disposed

in parallel positions to form spans, the space between the beams could be filled with hollow building blocks or other conventional material. After the lower runner has been clad with concrete on site, the upper portion of the element, i.e. the wire member and the upper runner, are clad with further concrete 17 so that the whole then forms a reinforced girder of inverted T-section.

Such a constructional element is of particular utility for overspanning purpose, e.g. in the construction of floors and roofs, especially in conjunction with hollow block floor slabs and like material.

#### WHAT WE CLAIM IS:—

1. A constructional element comprising a lower runner including two laterally spaced channels, an upper runner including an inverted channel, and a stiff filamentary member disposed longitudinally between the upper and lower runners and passing across between the upper and lower runners, said filamentary member including portions engaged in and locked in the channels of the upper and lower runners.

2. A constructional element, as claimed in claim 1, wherein the filamentary member is a symmetrical zig-zag having its bends engaged in the channels of the upper and lower runners.

3. A constructional element, as claimed in either of claims 1 and 2, wherein the filamentary member has portions engaged alternately in the two spaced channels of the lower runner.

4. A constructional element, as claimed in any one of the preceding claims, wherein the filamentary member is locked in the channels of the upper and lower runners by tenons formed in the side wall of the channels.

5. A constructional element, as claimed in any one of the preceding claims, wherein the upper and lower runners are each formed of cold-rolled or pressed steel strip.

6. A constructional element in any one of the preceding claims, wherein the upper and lower runners include edge portions turned over at a small radius.

7. A constructional element comprising a lower runner of steel strip including parallel U-shaped channels formed one adjacent each edge of the strip and downwardly turned edge portions of small radius and a shallow part-cylindrical trough centrally of the strip, an upper runner of steel strip including a single central channel of inverted U-section and intumed or outturned edge portions of small radius, and an interconnecting member in the form of a stiff steel wire bent to form a symmetrical zig-zag with rounded corners, said member being disposed longitudinally between the upper and lower runners and having all of its bends along its upper limit engaged in the central channel of the upper

- runner, and the bends along its lower limit engaged alternately in the parallel channels of the lower runner, said bends being engaged between the base of the respective channel and a tenon punched inwardly in the side wall of the channel.
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8. A constructional element, as claimed in any one of the preceding claims, provided with a first rectilinear cladding of concrete about the lower runner, and a second rectilinear cladding of concrete about the connecting member and the upper runner, thereby to form a reinforced concrete beam of inverted T-section.
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9. A constructional element constructed in the manner particularly described herein with reference to figs. 1 to 6, or fig. 7 of the accompanying drawing. 15
10. A reinforced concrete beam constructed in the manner particularly described herein with reference to fig. 8 of the accompanying drawing. 20

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